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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,654	02/27/2004	Sarah J. Lane	03052US	7256

7590

12/27/2005

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EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 12/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/788,654

Applicant(s)

LANE ET AL.

Examiner

Lynette T. Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 8-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 8-10 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/15/04 &amp; 11/8/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Claims 1-7 in the reply filed on 10/19/2005 is acknowledged.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
4. Claims 1-7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brusic (US '622 B1) in view of Singh (US 6,866,793B1, 3,480,076 B1).

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Brusic teaches contacting a substrate with a polishing system that comprises: an abrasive, a liquid carrier, and at least one polishing additives, and that has a pH of about 2 to 12 (column 2, lines 35-77).

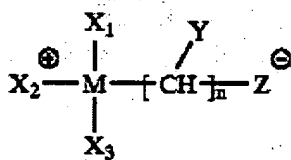
The abrasive comprises a metal oxide such as ceria (column 3, lines 20-35) and is present in the amount of 0.5 to 10 wt % (column 3, lines 36-49).

The liquid carrier is typically an aqueous carrier and can be water (column 3, line 50-59).

The polishing additive includes a zwitterionic compound that can be for example, (carboxymethyl)trimethylammonium hydroxide (betaine), (column 3, line 60 - column 4, line 3 and column 4, lines 31-33 and 41-55), which is the same as applicants' zwitterionic compound and also N, N, N-trimethylammonioacetate) and the system comprises 0.1 to 2 wt % of polishing additive (column 5, lines 8-13).

The above reads on,

An aqueous composition and encompasses an aqueous composition that comprises by weight percent 0.01 to 5 zwitterionic compound, 0.02 to 6 abrasive, 0 to 5 cationic compound and balance water, the zwitterionic compound having the following structure:



wherein n is an integer, Y comprises hydrogen or an alkyl group, Z comprises carboxyl, sulfate or oxygen, M comprises nitrogen, phosphorus or a sulfur atom, and X<sub>1</sub>, X<sub>2</sub> and

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X<sub>3</sub> independently comprise substituents selected from the group comprising, hydrogen, an alkyl group and an aryl group, **in claim 1**; and reads on,

an aqueous composition and encompasses an aqueous composition by weight percent 0.01 to 5 N, N, N-trimethylammonioacetate, 0.02 to 6 ceria, 0 to 5 cationic compound and balance water, wherein the aqueous composition has a pH of 4 to 9, **in claim 7**.

Brusic differs in failing to teach an aqueous composition useful for polishing silica and silicon nitride comprising by weight percent 0.01 to 5 polyacrylic acid polymer and , **in claims 1 and 7**.

Singh teaches selective adsorption additive can comprise surfactants or soluble polymers that include polyacrylic acid (column 6, lines 6-12) and the concentration of the polymeric additive is from 10mg/liter to 1gm/liter (~.01 g/100 ml - 10 g/100 ml ~ .01-10 wt %). Singh also teaches, "The control and modulation of the polishing characteristics can be achieved by substantial and non-substantial adsorption of the surfactant or polymer additives onto the particle, and the silicon nitride comprising film" (column 13, lines 15-19).

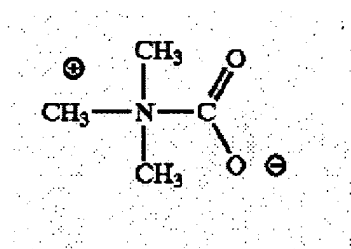
Since Singh illustrates a polymer additive, for example, polyacrylic acid polymer, in a polishing composition is known, then it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Brusic's composition by incorporating Singh's polyacrylic acid for the purpose of controlling and modulating the polishing characteristics of the material (Si<sub>3</sub>N<sub>4</sub>) being polished (Singh, column 13, lines 15-19). Furthermore, Since the combination of Brusic's cmp system

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and Singh's composition comprises the same chemicals as those of applicants' aqueous composition, then using the said combination cmp system in the same manner as claimed by applicants would result the same in an aqueous composition useful for polishing silica and silicon nitride on a semiconductor wafer use the same cmp, **in claims 1 and 7.**

The said above also reads on,

wherein the zwitterionic compound has the following structure, **in claim 2;**



wherein the cationic compound is selected from the group comprising: alkyl amines, aryl amines, quaternary ammonium compounds and alcohol amines, **in claim 3;**

wherein the abrasive is ceria, **in claim 4;**

wherein the ceria has an average particle size of between 50-200 nm, **in claim 5;** and

wherein the aqueous composition has a pH of 4 to 9, **in claim 6.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ltue

December 19, 2005

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SHAMIMAHMED  
PRIMARY EXAMINER